COVERED SOURCE PERMIT NO. 0220-01-C MODIFICATION
Permit Application No. 0220-08
Increase Throughput to 181,000,000 gallons per 12-months
Aloha Petroleum, Ltd. - 10 AST storage tanks and tank truck load rack

Facility: Aloha Petroleum, Ltd.
Barbers Point Sales Terminal, Campbell Industrial Park, Kapolei, Hawaii

Responsible Official: David Keith ph: 522-9700 x757
Title: General Manager Operations

POC: Rand Shannon phone: 673-4296
Terminal Manager
91-119 Hanua St.
Kapolei, HI 96707

SICC: 5171

Background:
Aloha Petroleum, Ltd. (Aloha) owns a bulk liquid storage and transfer facility located at Campbell Industrial Park, Kapolei, Oahu. This facility, known as the Barber's Point Sales Terminal, was upgraded in 1996 to provide operational flexibility and improve the efficiency of the terminal. Ten above ground storage tanks were built and a bottom-loading tank truck load rack with vapor recovery was installed. All but one of the ten storage tanks has an internal floating roof with primary seals. The nine internal floating roof tanks store unleaded gasoline. Fuel additive is stored in a 238 barrel fixed roof tank. The fuel additive tank is not subject to HAR 11-60.1-39 or NSPS 40 CFR 60 Subpart Kb.

The tank truck load rack has four stations, each with five load arms. The design throughput for the loading rack was based on the maximum number of load arms that can be used for a given period of time. The maximum number of load arms that can be used simultaneously is ten (10). With each arm capable of dispensing 900 gallons of fuel per minute, the load rack has a maximum throughput of 9,000 gallons per minute. At 24 hours a day, 365 days a year, the potential throughput is 112,628,571 barrels per year.

The limiting factor of the load rack is not the rack pump, but the vapor recovery unit. The vapor recovery unit can process 500,000 gallons per day, or 4,345,238 barrels per year. The carbon adsorption system is guaranteed to have maximum emission rate of 10 mg/l of loaded product. Source performance tests have verified the manufacturers' guarantee. Aloha also has a self-imposed throughput

limit of 2,389,752 barrels per rolling 12-month period.

Aloha also maintains pipelines from their facility to the marine terminals located at Barbers' Point Deep Draft Harbor and barge harbor. Currently there are 4 each, 8-inch product pipelines extending to the Barbers' Point Deep Draft Harbor and two each, 8-inch lines to the barge harbor. The marine loading operations are permitted under Noncovered Source Permit no. 0334-01-N.

Proposed Modification:

Aloha is proposing to increase the facility throughput from the currently permitted limit of 2,389,752 barrels per rolling 12-month period to 4,309,524 barrels per rolling 12-month period.

Equipment:

Storage tanks:

1 ea - 35,000 barrel internal floating roof tank, BT-201;
4 ea - 50,000 barrel internal floating roof tanks, BT-101, BT-102, BT-103, and BT-205;
1 ea - 60,000 barrel internal floating roof tank, BT-202;
2 ea - 68,000 barrel internal floating roof tanks, BT-203 and BT-204
1 ea - 5,000 barrel internal floating roof tank, BT-301

Bottom loading truck load rack with a John Zink vapor recovery unit

Air Pollution Controls:

Emissions from the storage tanks are controlled by the design characteristics of the tanks; internal floating roofs with primary seals.

A John Zink vapor recovery unit will control the emissions from the load rack. This unit is guaranteed to emit no more than 10 mg/l of fuel loaded. The unit consists of two (2) carbon steel vessels with 23,100 pounds of high efficiency granular activated carbon. The unit is designed to recover vapors displaced from the tank truck during loading. The displaced vapors flow through a condensate tank first, and then pass through only one of the steel vessels. The vapor flow is alternated between the two vessels, which allows for maintenance, repairs, and regeneration without interrupting the operation of the load rack.

Operational Limits:

Although some of the storage tanks will store diesel fuel, the emissions for all of the internal floating roof storage tanks were calculated for gasoline. This allows the operational flexibility of storing either fuel in the internal floating roof storage tanks, as the reid vapor pressure for gasoline is higher than that of diesel fuel. The throughput limit for each tank is the quantity the applicant used to calculate the emissions. The limits are as follows:

Tank #	Capacity	Throughput Limit	Turnovers
BT-101	50,000 bbls	317,500 bbl/yr	6.35
BT-102	50,000 bbls	317,500 bbl/yr	6.35
BT-103	50,000 bbls	317,500 bbl/yr	6.35
BT-201	35,000 bbls	296,450 bbl/yr	8.47
BT-202	60,000 bbls	508,200 bbl/yr	8.47
BT-203	68,000 bbls	575,960 bbl/yr	8.47
BT-204	68,000 bbls	575,960 bbl/yr	8.47
BT-205	50,000 bbls	423,500 bbl/yr	8.47
BT-301	5,000 bbls	15,000 bbl/yr	3

For operational flexibility, Aloha has a cumulative cap for the new tanks as opposed to an individual cap for each tank. Although there is a potential for an increase in actual emissions by using a cumulative cap, the potential increase in withdrawal losses are relatively small compared to the rim seal and deck fitting losses. Calculations were done for each tank with a total throughput of 4,309,524 barrels to confirm that the increase in withdrawal losses were minimal.

An automatic tank gauging system on each tank monitors the throughputs of the petroleum storage tanks. The gauges are connected to a computer-based accounting system that generates monthly reports.

The throughput of the load rack is limited by the design capacity of the vapor recovery unit, 500,000 gallons per day. Aloha is requesting to increase the annual throughput limit to 4,309,524 barrels per rolling 12-month period. The throughput of the load rack will be monitored by flow meters at each arm and records will be maintained on a daily basis.

The tank truck load rack is subject to NSPS Subpart XX. Under this subpart, only documented, vapor-tight tank trucks with a compatible vapor collection system can be loaded at this facility. The gauge pressure of the tank truck cannot exceed 4,500 pascals during the loading operation. The subpart also specifies that the vapor recovery system cannot emit more than 35 mg/l of gasoline loaded. However, the VRU manufacturer has guaranteed a limit of 35 mg/l of gasoline loaded.

Applicable Requirements:

Hawaii Administrative Rules (HAR):

Chapter 11-59, Ambient Air Quality Standards

Chapter 11-60.1

Subchapter 1, General Requirements

Subchapter 2, General Prohibitions

11-60.1-31 Applicability

11-60.1-39 Storage of Volatile Organic Compounds

Subchapter 5, Covered Sources

Subchapter 6, Fees for Covered Sources, Noncovered sources, and Agricultural Burning

11-60.1-111 Definitions

11-60.1-112 General Fee Provisions for Covered Sources

11-60.1-113 Application Fees for Covered Sources

11-60.1-114 Annual Fees for Covered Sources

11-60.1-115 Basis of Annual fees for Covered Sources

Subchapter 8, Standards of performance for Stationary Sources

11-60.1-161 New Source Performance Standards

Subchapter 9, Hazardous Air Pollutant Sources

CDS (Compliance Data System)

CDS is an inventory system for covered sources subject to annual inspections. CDS requirements do apply because the facility is a covered source.

NSPS:

The tank-truck load rack is subject to 40 CFR Part 60, Subpart XX because the date of construction is after the trigger date. Similarly, the petroleum storage tanks are subject to 40 CFR Part 60, Subparts Kb, because the construction date of the tanks is after the trigger dates.

Non-Applicable Requirements:

PSD:

PSD is not applicable to this facility because it is not a major stationary source.

CERR (Consolidated Emission Reporting Rule):

40 CFR part 51, Subpart A – Emission Inventory Reporting Requirements, determines applicability based on the emissions of each pollutant from any individual emission point within the facility that emits at the triggering levels. The emissions from the load rack and storage tanks are less than the 100 and 1,000 ton per year triggers.

NESHAP:

The load rack is not subject to 40 CFR Part 63 Subpart R because it is not a major source, as stated in

section 63.420(a)(2).

CAM:
The purpose of Compliance Assurance Monitoring (CAM) is to provide a reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 Code of Federal Regulations, Part 64, for CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential pre-control emissions that are 100% of the major source level; and (5) not otherwise be exempt from CAM. CAM is not applicable because the facility is not a major source.

BACT:
A Best Available Control Technology (BACT) analysis was not required because the VOC emissions increase is less than the 40 tons per year trigger. VOC emissions increase from the proposed modification was estimated at 4 tons per year.

Synthetic minor:
A synthetic minor is a facility that without limiting conditions, physical or operational, emits above the major source triggering levels as defined by HAR 11-60.1-1 for either criteria pollutant(s) or hazardous air pollutant(s). This facility is not a synthetic minor, as the throughput limit is the design maximum of the VRU and is not used to prevent the facility from becoming major source.

Calculations:
Emission factors for the tanks were taken from AP-42, section 7.1 - Organic Liquid Storage Tanks, revised 9/97. The throughput quantities used to calculate the emissions were given in the application. All of the tanks were calculated for gasoline storage. The applicant, however, may store diesel fuel in lieu of gasoline in several of the tanks. This should pose no problems as the reid vapor pressure for diesel is much lower than that of gasoline. Although tank number BT-301 is intended to store a variety of petroleum waste products, the emissions were calculated for gasoline storage as the reid vapor pressure of the commingle should not exceed that of gasoline.

Calculations were also done to predict the emissions from each tank using a cumulative throughput of 4,309,524 barrels per year. As expected, the increases were insignificant, 0.2 tons per year. As such, the current permit condition which caps the throughput of the tanks will be removed.

For the tanks, there was no significant emissions increase from the proposed throughput. Almost all of the VOC losses are due to the tank construction and, as demonstrated above, turnover (withdrawal) losses are less than 50 pounds per year for each tank. The emissions increase from the higher turnover rate amounted to several pounds of VOC per tank per year.

The emission factors used for the load rack are from AP-42, section 5.2 - Transportation and Marketing of Petroleum Liquids, revised 1/95. The maximum flow rate of the load rack was determined by the design capacity of the vapor recovery unit, 500,000 gallons per day. At this flow rate, 182,500,000 gallons per year, the annual emissions are 7.6 tons. The proposed throughput limit is

close to the maximum, and thus by rounding, the emissions from handling 181,000,000 gallons per year are also 7.6 tons.

In total, emissions at the facility will increase from 57 tons per year VOC to 61 tons per year.

Calculations for the tanks and the load rack are in the appendix.

Alternate Operating Scenarios:

The only alternate operating scenario for the storage tanks is to store diesel fuel in lieu of gasoline. It is not known how many tanks will store diesel fuel, but should Aloha decide to store diesel fuel in the tanks, the emissions should drop, as the reid vapor pressure for diesel is lower than that of gasoline.

Other Considerations:

Aloha used different tank identification numbers for the tanks in this application than previous applications. After discussing it with Aloha's terminal superintendent, it was determined that the tank numbers in the previous applications were incorrect. As such, the tank numbers will be changed in the permit to reflect this.

Conclusion:

The estimated emissions increase is small and the facility currently utilizes BACT on the storage tanks and load rack. The facility has been operating in compliance with the current CSP and should continue to operate in compliance with the proposed throughput increase.

Recommendation:

Issue permit with the proposed throughput limits and new tank numbers.

Appendix

Revised Special Conditions

Attachment IIA

1. **Current**

Attachment IIA of this permit encompasses:

(a) three (3) each 50,000 barrel Internal Floating Roof Petroleum Storage Tanks, no. BT-101, BT-102, and BT-103;

(b) one (1) each 35,000 barrel Internal Floating Roof Petroleum Storage Tank, no. BT-201;

(c) one (1) each, 60,000 barrel Internal Floating Roof Petroleum Storage Tank, no. BT-202;

(d) two (2) each, 68,000 barrel Internal Floating Roof Petroleum Storage Tanks, no. BT-203 and BT-204;

(e) one (1) each 50,000 barrel Internal Floating Roof Petroleum Storage Tank, no. BT-205;

(f) one (1) each, 5,000 barrel Internal Floating Roof Commingle Petroleum Storage Tank, no. BT-301;

(g) one (1) each, 238 barrel Horizontal Above Ground Gas Additive Storage Tank, no. BT-ADD; and

(h) five (5) each, 8-inch petroleum pipeline and associated fittings and valves from the manifold to the marine terminals at the barge harbor and deep draft harbor.

Revised - changed tank numbers

Attachment IIA of this permit encompasses:

(a) four (4) each 50,000 barrel Internal Floating Roof Petroleum Storage Tanks, no. 50101, 50102, 50103, and 50205;

(b) one (1) each 35,000 barrel Internal Floating Roof Petroleum Storage Tank, no. 35201;

(c) one (1) each, 60,000 barrel Internal Floating Roof Petroleum Storage Tank, no. 60202;

(d) two (2) each, 68,000 barrel Internal Floating Roof Petroleum Storage Tanks, no. 68203 and 68204;

(e) one (1) each, 5,000 barrel Internal Floating Roof Commingle Petroleum Storage Tank, no. BT-301;

(f) one (1) each, 238 barrel Horizontal Above Ground Gas Additive Storage Tank, no. 2000; and

(g) five (5) each, 8-inch petroleum pipeline and associated fittings and valves from the manifold to the marine terminals at the barge harbor and deep draft harbor.

Note: Several other conditions that are not listed here were revised to reflect the changes to the tank numbers.

2. **Current**

C.1. The maximum cumulative throughput for storage tanks BT-101, BT-102, BT-103, BT-201, BT-202, BT-203, BT-204, and BT-205 shall not exceed 3,000,000 barrels per rolling twelve (12) month period. Tank BT-301 shall not exceed 15,000 barrels per rolling twelve (12) month period.

Revised - removed throughput limit of tanks

This condition has been deleted

Attachment IIB

Current

C.3. The maximum throughput of the petroleum truck loading rack shall not exceed 100,369,583 gallons (2,389,752 barrels) per rolling twelve (12) month period.

Revised - raise throughput limit

C.3. The maximum throughput of the petroleum truck loading rack shall not exceed 181,000,000 gallons (4,309,524 barrels) per rolling twelve (12) month period.